

*miles*, in order to induce subscribers to relinquish it for a rail-way; and my reasons are, that when a rail-way is laid down, it excludes, in a great measure, the return trade, and shuts out the prospect of extension; the country beyond its extremity, has no more hope of assistance, than before its construction; nor will any company unite with it; for if it is added to, the difficulties increase, as passing places are inadequate to an important trade; consequently, it would be necessary to form them double, increasing the expence and repairs; without the power of raising succours to the high and interior country.

Yet the small canal is sufficiently wide to pass at every part, and transfers a trade with equal ease; meandering the hills, it holds out assistance to the sun-burnt fields, and seems to invite connection: In a country, through which a rail-way or canal is constructed, there is some hope of progressive improvement and future extension; which ultimately brings this enquiry to two questions: Whether do canals, or rail-ways, present the best prospect of extension? And, Which will most facilitate conveyance by a union of branches?

It is therefore prudent to consider well the various circumstances, before a rail-way, of even one mile in length, is laid down.

Rail-ways of one mile, or thereabouts, will no doubt be frequently necessary, where it may be difficult to find water at the extremity; or when the trade from the works is not sufficient to pay the expence of machinery, and its extent being but one mile, can be of little importance to the country.

But

But to bring these short spaces into the general system as much as possible, see D, in the Plate of Parts: which represents the apparatus for returning the empty boats to the collieries, or other works, in cases where a regular descent can be obtained. Suppose, for instance, such works distant six hundred, or perhaps, more yards, a single rail-way may be constructed; on the summit of which the apparatus D is formed; and a carriage being constructed to receive the boat, the leading rope laps round the vertical wheel F; which wheel works by a multiplied movement in the wheel of the shaft G, to which a weight is suspended; on a loaded boat descending the rail-road, its power will wind up the weight; which weight is kept up by a stopper on the wheel, and is a power in reserve to draw up an empty boat; hence, when a loaded boat descends, it winds up the weight, and on entering the canal, the shaft of F and G are cast out of gear, which suffers the carriage to descend sufficiently to allow the boat to float: an empty boat is then placed in this carriage; and the stopper being cast off the wheel on the G shaft, the descending weight will raise the empty boat; the movement being regulated by a break, on the shaft of F there are two pinions of different diameters, which are, that the wheel F performs more revolutions in a boat ascending than descending. When the boat descends, raising the weight, she loses her power on entering the canal; consequently, the pinions must be cast out of gear in order to give more length of rope for the carriage to descend, and allow the boat to float; therefore, the portion of rope thus let off, must be wound up by the power of the weight, on returning the empty boat; which is done by casting the small diameter into gear. In the return movement, this mode of working will be found a very considerable saving to the proprietor, in consequence of a single plane and rope answering the purpose; and, in order that the plane may be